UTILITY PATENT APPLICATION TRANSMITTAL UNDER 37 C.F.R.§1.53(b)

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Washington D.C. 20231

Case Docket No.: HI-017

Sir:

Transmitted herewith for filing is the patent application of
INVENTOR OR APPLICATION IDENTIFIER: Sang Ho LEE
FOR: SYSTEM AND METHOD FOR CONTROLLING DUPLEXING IN AN ATM SWITCHING SYSTEM
Enclosed are:

1. [X] 25 pages of specification, claims, abstract
2. [X] 2 sheets of FORMAL drawing.
3. [X] 2 pages of newly executed Declaration & Power of Attorney (original).
4. [X] Priority Claimed to Korean Appln. No. 40760/1999, whose entire disclosure is incorporated herein by reference.
5. [ ] Small Entity Statement.
6. [ ] Information Disclosure Statement, Form PTO-1449 and reference.
7. [X] Assignment Papers for LG Electronics, Inc. (cover sheet, assignment & assignment fee).
8. [X] Certified copy of Korean Patent Application No. 40760/1999.
9. [X] Two (2) return postcards.
   [X] Stamp & Return with Courier.
   [X] Prepaid Postcard-Stamped Filing Date & Returned with Unofficial Serial Number.
10. [X] Authorization under 37 C.F.R. §1.136(a)(3).
11. [X] Other: Preliminary Amendment

CLAIMS AS FILED					
For	No. Filed		No. Extra	Rate	Fee
Total Claims	25	- 20	5	X $18.00	$ 90.00
Indep. Claims	5	- 3	2	X $78.00	$156.00
Multiple Dependent Claims (If applicable)				X $260.00	$ 0.00
				BASIC FEE	$690.00
				TOTAL FILING FEE	$936.00

[ ] This is a Continuation-in-part (CIP) of prior application No: _____ filed _____. Incorporation By Reference-The entire disclosure of the prior application is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

[ ] Amend the specification by inserting before the first line the sentence:
--This application is a continuation-in-part of Application Serial No. _____ filed _____.--

[X] A check in the amount of $936.00 (Check #9424) is attached.

[ ] Please charge my Deposit Account No. 16-0607 in the amount of $__. A duplicate copy of this sheet is enclosed.

[X] The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 16-0607. A duplicate copy is enclosed.
[X] Any additional filing fees required under 37 C.F.R. 1.16.

[X] The Commissioner is hereby authorized to charge payment of following fees during the pendency of this application or credit any overpayment to Deposit Account No. 16-0607. A duplicate copy of this sheet is enclosed.
[X] Any patent application processing fees under 37 C.F.R. 1.17.
[X] Any filing fees under 37 C.F.R. 1.16 for presentation of extra claims.

FLESHNER & KIM, LLP

Daniel Y.J. Kim
Registration No. 36,186
Anthony H. Nourse
Registration No. 46,121

Correspondence Address Below:
P.O. Box 221200
Chantilly, VA 20153-1200
(703) 502-9440 DYK/AHN:dcp
Date: September 20, 2000

Docket No.: HI-017 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
:
Sang Ho LEE :
:
Serial No. New U.S. Patent Application :
:
Filed: September 20, 2000 :
:
For: SYSTEM AND METHOD FOR CONTROLLING DUPLEXING IN AN ATM SWITCHING SYSTEM

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D. C. 20231

Sir:

Prior to initial examination on the merits, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the specification as follows:

Page 11, line 13, change "S/W" to --software--.

IN THE CLAIMS:

Please amend claims 1, 2, 3, and 21 as follows:

1. (Amended) A method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards, each of the plurality of

boards coupled to an input/output bus and having a plurality of input/output ports for transmitting/receiving state information, comprising:

[identifying a first board initially in an active state and a second board initially in a standby state from among the plurality of duplexing control boards;]

monitoring state information of [the] first and second boards using the plurality of input/output ports;

determining an active or standby state of each of the first and second boards according to the monitored state information;

generating information to transfer an active authority to the second board, and forming presently processed data of the first board into ATM cell information, when the second board is required to assume the active state; and

switching the duplexing to the second board according to the generated information in the form ATM cell information.

2. (Amended) The method of claim 1, wherein a state of a MS port determines whether a board is the first board [in the active state] or the second board [in the standby state] when the board is mounted to pins of a backboard of the ATM system.

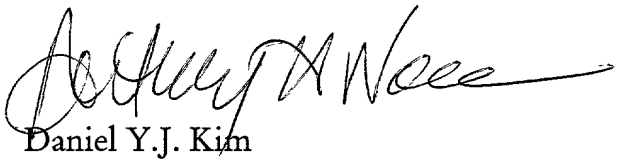
3. (Amended) The method of claim 1, wherein a recognition of and a conversion between the active state and the standby state are carried out by recognizing a state of [the second] each board.

21. (Amended) The method of claim 6, wherein the other information is one of update information and a [S/W] software change.

REMARKS

Claims 1-25 are pending. By this Amendment, claims 1, 2, 3, and 21 are amended. Prompt examination and allowance in due course are respectfully solicited.

Respectfully submitted,
FLESHNER & KIM, LLP



Daniel Y.J. Kim
Registration No. 36,186
Anthony H. Nourse
Registration No. 46,121

P.O. Box 221200
Chantilly, VA 20153-1200
703 502-9440
Date: September 20, 2000
DYK/AHN:dcp

APPLICATION FOR UNITED STATES LETTERS PATENT

INVENTORS: Sang Ho LEE

TITLE: SYSTEM AND METHOD FOR CONTROLLING DUPLEXING IN AN ATM SWITCHING SYSTEM

ATTORNEYS & ADDRESS: FLESHNER & KIM, LLP
P. O. Box 221200
Chantilly, VA 20153-1200

DOCKET NO.: HI-017

SYSTEM AND METHOD FOR CONTROLLING DUPLEXING IN AN ATM SWITCHING SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an Asynchronous Transfer Mode (ATM) switching system, and more particularly to a system and method for controlling duplexing in an ATM system.

2. Background of the Related Art

In general, an ATM switching system uses an asynchronous transfer mode, in which user information is formed as a cell. The cell includes a five byte header sector including destination information for transmission the information, and a 48 byte payload sector including data information. The user information is transmitted through an output port using switching according to the information recorded in the header sector.

Figure 1 is a schematic block diagram of a related art ATM switching system. As shown in Figure 1, when an audio signal, a video signal, data, or the like, to be transmitted to a prescribed destination is inputted into an ATM multiplexer 1, the ATM multiplexer 1 forms a cell. The cell includes data information and destination information for the inputted signals. The ATM multiplexer transmits the cell to an ATM switch 2. Then, the ATM switch 2 switches an output port of a destination of transmission, based on the

received header information of the cell, and outputs an output of the cell through the output port.

The ATM switching system, which transmits information by means of a cell as described above, includes two boards having the same construction. These boards are respectively maintained in an active state and in a standby state. Inter-processor communication (IPC) for exchanging information between processors is maintained between the processors of the two boards, so as to maintain stability and reliability in the transmission/reception of data.

In such an ATM switching system, when a first board in an active state is separated or the system experiences trouble, the first board executes a switching of duplexing procedure. By doing this, the first board transfers active authority and data information, which has already been processed by the first board to a second board, which is in a standby state. It does this through an IPC communication. When the trouble of the first board has been settled, the first board is maintained in the standby state.

Figure 2 shows a schematic block diagram of a related art duplexing system, which can continuously operate an ATM switching system, even when a board is separated or the ATM switching system experiences trouble.

As shown in Figure 2, each of boards A and B includes a high speed serial input/output (SIO) board A2 and B2 for rapidly transmitting/receiving information between the boards. Accordingly, when switching from Board A (the present board) to

Board B (the opponent board) in order to transmit/receive state information between the boards having the duplexing construction and data processing information, data required in the SIO communication needs to be changed and restored (i.e. segmented and reassembled). This delays the receipt of information by the opponent board. It further results in a loss of the transmitted/received data in the course of processing it into data necessary in the SIO communication. Moreover, when the SIO board experiences trouble, the transmission/reception of information between the boards is not carried out, and normal switching of duplexing is thus not performed.

The above references are incorporated by reference herein where appropriate for appropriate teachings of additional or alternative details, features and/or technical background.

SUMMARY OF THE INVENTION

An object of the present invention is to substantially obviate the problems caused by disadvantages of the related art.

It is another object of the present invention to provide a system and method for controlling duplexing in an ATM system, in which state information can be transmitted/received between two boards having a duplexing construction through a pin-to-pin connection.

It is another object of the present invention to provide a system and method for controlling duplexing in an ATM system in which a board in an active state forms data information being processed by itself into an ATM cell and transfers the ATM cell together with an active authority to an opponent board through a common bus, so that a duplexing control can be stably performed without adding a separate hardware.

To achieve at least these objects in whole or in parts, there is provided a method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards connected to an input/output bus and input/output ports for transmitting/receiving state information, the method comprising the steps of: determining at least a master board and at least a slave board from among the duplexing control boards; recognizing state information of an opponent board from information of the input/output ports connecting the master board and the slave board with each other, the duplexing control boards being respectively maintained in an active state and in a standby state; generating information for transferring an active authority, and forming data information presently being processed into ATM cell information, when a switching of duplexing of a board in the active state is necessary according to the state information recognized in the recognizing step; and performing the switching of duplexing according to the information and the ATM cell information.

To further achieve at least these objectives in whole or in parts, there is provided a system for controlling duplexing in an ATM system, the ATM system including a

plurality of duplexing control boards connected to an input/output bus and input/output ports for transmitting/receiving state information, comprising a first interface means matching with an input bus so as to interface a received ATM cell; second interface means matching with an output bus so as to interface a transmitted ATM cell; cell disassembling and assembling means for disassembling and assembling data unit contained in an application layer in the transmitted/received ATM cell by a unit of ATM cell; control means for controlling general operation in order to maintain the active state according to data processing information contained in a signal applied from the cell disassembling and assembling means, when the its own board is endowed with the active authority by the signal; and memory means for storing data transmitted/received for the switching of duplexing between the boards.

Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objects and advantages of the invention may be realized and attained as particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

Figure 1 is a schematic block diagram of a related art ATM switching system;

Figure 2 is a schematic block diagram of a related art duplexing control system of the ATM switching system of Figure 1;

Figure 3 is a schematic block diagram of a duplexing control system of an ATM switching system according to a preferred embodiment of the present invention; and

Figure 4 is a constructional view of an ATM cell used to achieve duplexing control by the duplexing control system of the ATM switching system according to a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Figure 3, a duplexing control system of an ATM switching system according to a preferred embodiment of the present invention includes first and second duplexing control boards A10 and B10, which are respectively coupled to an input bus A-bus and an output bus C-bus. For purposes of clarity, whenever a board is receiving information from or otherwise probing another board, that board is sometimes referred to the present board, and the other board is referred to as the opponent board. The first and second boards A10 and B10 each respectively include a plurality of input/output ports, including ACTOWN, CARDDIS, CARDNOR, PAIRACT, PAIRDIS, PAIRNOR, and MS. Each of these ports is respectively connected to opponent ports, so as to transmit/receive state information between the boards A10 and B10.

Further, the boards A10 and B10 respectively include first and second A-bus interfaces A11 and B11, C-bus interfaces A12 and B12, segmentation and reassembly (SAR) sections A13 and B13, control sections A14 and B14, and DRAMs A15 and B15.

Each A-bus interface A11 and B11 preferably couples to the input bus A-bus to perform an interface of a received ATM cell. Each C-bus interface A12 and B12 preferably couples to the output bus C-bus so as to perform an interface of a transmitted ATM cell.

Each SAR section A13 or B13 preferably performs the functions of disassembling and assembling data units contained in an application layer, or transmitted/received data information in the transmitted/received ATM cell by the unit of cell.

Each control section A14 and B14 preferably detects data information of the opponent board, detected through the disassembling and assembling of the cell by the SAR A13 or B13. Then, when the present board has the active authority, the control section performs a control for maintaining the active state, and stores all information, which has been processed in the opponent board, in DRAM A15 or B15.

Each DRAM A15 and B15 stores data, which is received according to control signals applied from the control section A14 or B14, in designated addresses, and outputs corresponding data according to access requests of the control section A14 or B14.

As stated above, the input/output ports of the first and second boards A10 and B10 include ACTOWN, CARDDIS, CARDNOR, PAIRACT, PAIRDIS, PAIRNOR, and

MS. These ports are used for transmitting/receiving state information between the boards. Each port will now be described.

The ACTOWN port is configured to inform the opponent board of the state of the present board, e.g. active state or standby state.

The PAIRACT port is coupled to the opponent ACTOWN port, and recognizes if the opponent board is in the active state or the standby state.

The PAIRDIS port is configured to output a signal to reset the opponent board.

The CARDDIS port is coupled to the opponent PAIRDIS port, and resets the present board when a reset signal is received from the PAIRDIS port.

The CARDNOR port is configured to transmit state information of the present board, e.g. whether it is in a normal state or an abnormal state, to the opponent board.

The PAIRNOR port is coupled to the opponent CARDNOR port, and recognizes the state information of the opponent board according to the signal received from the CARDNOR port.

The MS port provides information as to whether the present board is a master board or a slave board.

Figure 4 is a constructional view of an ATM cell transmitted/received through the input bus A-bus and the output bus C-bus. As shown in Figure 4, the ATM cell preferably includes a header of five bytes, which indicates a destination of transmitted data. The ATM cell further includes a payload of 48 bytes containing data information.

The first connected side is indicated by the initial three bytes of the payload. Of these three bytes, two bits indicate node information, four bits indicate slot information, three bits indicate port information, and eight bits indicate information of a virtual channel (VC) and a virtual path (VP) for enabling switching between the boards by providing the state information. In the preferred embodiment, 16 boards may be employed in a bus. Also, a maximum of eight ports may be employed in a board, and 16 slots may form one node. A maximum of four nodes may be used.

The second three bytes in the payload indicate the other connected side, and have the same construction as that of the initial three bytes. The remaining bytes of the payload include information, such as a cell type or a bandwidth of the connection with the virtual path (VP) and virtual channel (VC), for example.

A duplexing control process by a duplexing control system of an ATM switching system according to a preferred embodiment of the present invention will now be described. First, a determination is made as to which of two boards, for example Board A and Board B, is a master board, and which is a slave board. This is preferably done by recognizing (i.e. analyzing) a MS signal of each board. Thus, where the board is mounted to a fixed pin of a BACKBOARD of the system, an MS of "1" (high) indicates a master board, and an MS of "0" (low) indicates a slave board. In this example, Board A is the master board and is initially in an active state and Board B is the slave board and is initially in a standby state.

If the active state of the master board is changed, that is, the master board cannot perform a normal operation, the CARDNOR signal of the master board is changed from "1" to "0". Meanwhile, the slave board periodically checks the PAIRACT signal and the PAIRNOR signal of the master board. When even one of the PAIRACT signal and the PAIRNOR signal becomes "0", the slave board converts the state of the PAIRDIS of the slave board from "0" to "1", so as to reset the master board, and switches the standby state of the ACTOWN and the CARDNOR to "1", so as to switch the state of the slave board into the active state.

Thereafter, the slave, which is now in the active state, switches the PAIRDIS signal to "0", so as to release the reset of the master board. The master board then determines the state of the ACTOWN and the CARDNOR of the slave board (presently in the active state), and switches to the standby state when the state of the ACTOWN and the CARDNOR of the slave board is "1".

Switching of peripheral devices of the boards for the duplexing is thus carried out according to information of the VP and the VC, which is data of the payload in the ATM cell.

By way of example, assume that a condition is set, where VP:0 (LOW) and VC:255 are used when the master board forwards the cell and VP:1 (HIGH) and VC:255 are used when the slave board forwards the cell. When the master board is in the active state, the information is changed into the ATM cell in the master board (VP:0 and VC:255), and is

then sent to the opponent slave board by the control section. When the ATM cell arrives at the slave board, the slave board confirms details of the cell, and includes corresponding information in the control information for the switching.

Next, when the slave board is in the active state, the information is changed into the ATM cell in the slave board (VP:1 and VC:255), and is then sent to the opponent master board by the control section. When the ATM cell arrives at the master board, the master board confirms details of the cell, and includes corresponding information in the control information for the switching.

When a corresponding cell is generated in the above process, it is recognized that there is a change in the connection. When the VP and the VC among the cell data are respectively 0 and 0, it is recognized that there is no change in the connection, but that there is a change in other information generated during the operation, such as update information or an S/W change, so that switching between boards is not performed.

When initialization of the system is performed, for example, by initially applying electric power to the boards, or applying a reset signal from the PAIRDIS port of the opponent board to the CARDDIS port of its own board, information of the MS port of the opponent board (backboard information of the system) is analyzed through the MS port of the present board. This is done to determine if the present board is the master board or the slave board. When it is the master board, the state of the opponent board is

confirmed by analyzing information of the opponent board received through the input ports including the CARDDIS port, the PAIRACT port, and the PAIRNOR port.

In the preferred embodiment, when it is determined that the opponent board is not being maintained in the active state, the present board is determined to be in the active state. Thus, its own state (the active state) is reported to the opponent board through the ACTOWN port. Further, when the present board is determined to be in the active state as described above, and when the state of the opponent board, which is detected through the input ports of the present board (including the CARDDIS port, the PAIRACT port, and the PAIRNOR port), is a normal state, although it is not the active state, the control section A14 or B14 ascertains that the present board is processing data in an active state into cell information having the construction as shown in Figure 4. This done through the SAR A13 or B13. The cell information is then transferred to the opponent board.

Further, when the board is mounted to slots for the first time and the mounted board is maintained in the slave state, the state of the opponent board is confirmed in the process as described above after waiting one-second. As a result of the confirmation, when it is determined that the opponent board is maintained in the active state, the present board is continuously maintained in the slave state. On the contrary, when it is determined that the opponent board is not in the active state, the present board is operated in the active state. This is done to inform the opponent board of the state information of the present board through the process as described above.

Moreover, when two boards for duplexing are simultaneously mounted to the slots, a board, which is not maintained in the active state, demands from the other (i.e. opponent) board, which is maintained in the active state, the state information of the opponent board through the ATM cell information having the construction as shown in Figure 4. The opponent board maintained in the active state forms the present connection state of the opponent board into an ATM cell information as shown in Figure 4 through the SAR A13 or B13, and transfers the ATM cell information to the requesting board.

Further, when the board, which is not in the active state, is mounted for the first time, it forms all present data into an ATM cell. That is, information in relation to the virtual channel and the virtual path of the connection is formed into an ATM cell as shown in Figure 4. The board then transfers the ATM cell to the opponent board.

When an initialization of the board has been carried out for the various states described above, the ATM cell is transmitted/received through the input bus A-bus and the output bus C-bus. In this example, since the output bus C-bus is maintained in the active state, the ATM cell received in each board through the C-bus interface A12 or B12 is transmitted to the control section A14 or B14 through the SAR A13 or B13. Additionally, the control section of the board maintained in the active state processes the received data, while the control section of the board not maintained in the active state abandons the received data.

When a first board is maintained in an active state and a second board is maintained in a standby state as described above, and the board in the active state comes into an abnormal state, the second board in the standby state performs the duplexing operation. That is, the second board in the standby state sends a reset signal to the first board in the active state through the PAIRDIS port of the second board, so as to reset the first board (the board in the active state). The second board operates in the active state and reports a signal for its state to the opponent board.

As described above, the duplexing control system of an ATM switching system according to the present invention has many advantages. For example, the duplexing system detects state information between boards through pin-to-pin transmission/reception, and performs a switching of duplexing. When this occurs, the boards, which are respectively in an active state and in a standby state, respectively recognize their changed states through ports. They then form data information to be processed into an ATM cell and transfer the ATM cell through a cell bus to the board endowed with an active authority. Therefore, the duplexing control system of an ATM switching system according to the preferred embodiment of the present invention can carry out a stable switching of duplexing. Moreover, it has a simple circuit construction since a separate board does not have to be installed in the system.

The foregoing embodiments and advantages are merely exemplary and are not to be construed as limiting the present invention. The present teaching can be readily

applied to other types of apparatuses. The description of the present invention is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

WHAT IS CLAIMED IS:

1. A method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards, each of the plurality of boards coupled to an input/output bus and having a plurality of input/output ports for transmitting/receiving state information, comprising:

identifying a first board initially in an active state and a second board initially in a standby state from among the plurality of duplexing control boards;

monitoring state information of the first and second boards using the plurality of input/output ports;

generating information to transfer an active authority to the second board, and forming presently processed data of the first board into ATM cell information, when the second board is required to assume the active state;

switching the duplexing to the second board according to the generated information in the form ATM cell information.

2. The method of claim 1, wherein a state of a MS port determines whether a board is the first board in the active state or the second board in the standby state when the board is mounted to pins of a backboard of the ATM system.

3. The method of claim 1, wherein a recognition of and a conversion between the active state and the standby state are carried out by recognizing a state of the second board.

4. The method of claim 1, wherein the ATM cell comprises a header to indicate a destination of transmitted data and a payload containing data information, the payload having first and second three bytes segments, in which two bits indicate node information, four bits indicate slot information, three bits indicate port information, and eight bits indicate virtual channel and virtual path information.

5. The method of claim 1, wherein the ATM cell information transferred to the second board comprises a virtual path and a virtual channel, which are respectively 0 and 255 when the first board is in the active state, and are respectively 1 and 255 when the second board is in the active state.

6. The method of claim 1, wherein the virtual path and the virtual channel of the ATM cell information are respectively zero when there is no a change in the connection, but there is a change in other information generated during an operation of the system.

7. The method of claim 1, wherein a CARDNOR signal is changed from "1" to "0" when the first board cannot perform a normal operation, and wherein the second board converts a state of a PAIRDIS of the second board to "1", to reset the first board and switch the state of the second board into the active state, when one of a PAIRACT signal and a PAIRNOR signal of the first board becomes "0" so as to transfer the active authority from the first board to the second board for the switching of duplexing.

8. The method of claim 7, wherein the second board switches the state of the PAIRDIS to "0" to release the reset of the first board after the second board is converted into the active state, and sets the master board to the standby state when the state of a ACTOWN signal and a CARDNOR signal of the second board is "1".

9. The method of claim 1, wherein information of an MS port of the second board is analyzed through an MS port of the first board, and when the second board is in the standby state, the active state of the first board is recognized and reported through an ACTOWN port to the second board upon an initialization of the system.

10. The method of claim 1, wherein the state of the first board is confirmed when the second board is initially mounted to slots and is maintained in the standby state, and the second board maintains its standby state when the first board is in the active state,

and wherein the second board is operated in the active state and informs the first board of its state through an ACTOWN port when the master board is in the standby state.

11. The method of claim 1, wherein, when two duplexing boards are simultaneously mounted to slots, a first board, which is not maintained in the active state, requests state information form a second board maintained in the active state through the ATM cell information, and wherein the second board in the active state forms state information of the second board into an ATM cell information, and transfers the ATM cell information to the first board.

12. A system for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards connected to an input/output bus, comprising:

a first interface circuit configured to couple with an input bus to interface a received ATM cell;

a second interface circuit configured to couple with an output bus to interface a transmitted ATM cell;

a cell disassembling and assembling circuit to disassemble and assemble a data unit contained in an application layer in the transmitted/received ATM cell by a unit of ATM cell;

a control circuit to control an operation to maintain the active state according to data processing information contained in a signal received from the cell disassembling and assembling circuit, when a first board is endowed with the active authority by the signal;

a plurality of input/output ports coupled to the input/output bus to transmit/receive state information; and

13. The system of claim 12, further comprising memory to store data transmitted/received for the switching of duplexing between the boards.

14. The system of claim 12, wherein the first interface circuit comprises an A-bus interface.

15. The system of claim 12, wherein the second interface circuit comprises a C-bus interface.

16. The system of claim 12, wherein the plurality of input/output ports comprise:

an ACTOWN port to inform a second board of information as to whether a first board maintains the active state or the standby state;

a PAIRACT port coupled to the ACTOWN port, to recognize if the second board is maintained in the active state or the standby state;

a PAIRDIS port to output a signal to reset the second board;

a CARDDIS port coupled to the PAIRDIS port, the CARDDIS port resetting the first board when a reset signal is applied from the PAIRDIS port;

a CARDNOR port to transmit information as to whether the first board is currently maintained in a normal state or in an abnormal state, to the second board;

a PAIRNOR port coupled to the CARDNOR port, the PAIRNOR port recognizing state information of the second board according to a signal received from the CARDNOR port; and

an MS port having information as to whether the first board is a master board or a slave board.

17. The method of claim 1, wherein the first board is a master board in the second board is a slave board.

18. The method of claim 1, wherein the state information is provided to each of the first and second boards through the input/output ports connecting the first board to the second board.

19. The method of claim 1, wherein the state information determines when the second board is required to assume the active state.

20. The method of claim 2, wherein the state of the MS port is determined when the board is mounted to pins of a backboard of the ATM system.

21. The method of claim 6, wherein the other information is one of update information and a S/W change.

22. A method of controlling duplexing, comprising:

recognizing state information of a first and second duplexing control board by monitoring a plurality of input/output ports on each of the first and second duplexing control boards;

forming transfer commands to transfer active authority from one of the first and second control boards to the other control board;

forming ATM cell information from data presently being processed in an active one of the first and second control boards; and

switching the active authority from one of the first and second control boards to the other control board.

23. A duplexing control circuit, comprising:

an interface circuit to couple to an input/output bus;

a control circuit to maintain an active state of the duplexing control circuit based on ATM cell data and state information;

a plurality of input/output ports coupled to the input/output bus to transmit state information of the duplexing control circuit, and receive state information from at least one other duplexing control circuit.

24. The circuit of claim 23, wherein the state of the duplexing control circuit is one of an active state and a standby state, and wherein the duplexing control circuit monitors state information of at least one other duplexing control circuit.

25. A method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards connected to an input/output bus and input/output ports for transmitting/receiving state information, comprising:

determining at least one master board and at least one slave board from among the plurality duplexing control boards;

recognizing state information of an opponent board from information of the input/output ports connecting the master board to the slave board, the duplexing control boards being respectively maintained in an active state and a standby state;

generating information to transfer an active authority, and forming data information presently being processed into ATM cell information, when a switching of duplexing of a board in the active state is necessary according to the recognized state information; and

switching the duplexing according to the generated information and the formed ATM cell information.

ABSTRACT OF THE DISCLOSURE

A duplexing control system and method of an ATM switching system capable of carrying out a stable switching of duplexing with a simple circuit construction is disclosed. The system has two boards respectively having a first interface matching with an input bus so as to interface received ATM cell, a second interface matching with an output bus so as to interface a transmitted ATM cell, an SAR for disassembling and assembling data unit contained in an application layer in the transmitted/received ATM cell by a unit of ATM cell, a control section for controlling general operation in order to maintain the active state according to data processing information contained in a signal applied from the cell disassembling and assembling means, when the its own board is endowed with the active authority by the signal, and a DRAM for storing data transmitted/received for the switching of duplexing between the boards. The duplexing control system and method in an ATM system causes data processing information of one board and a duplexing authority to be formed into an ATM cell and to be transferred through a cell bus, so that a duplexing control can be stably carried out.

Fig. 1

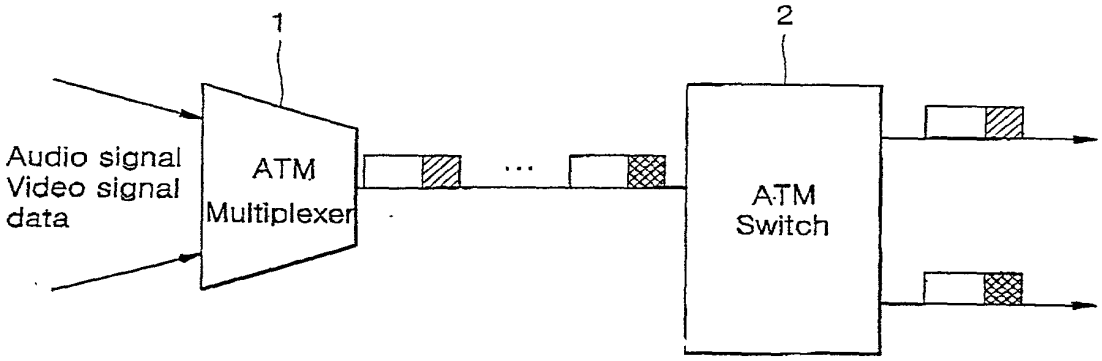

1
2
Audio signal
Video signal
data
ATM
Multiplexer
ATM
Switch

Fig. 2

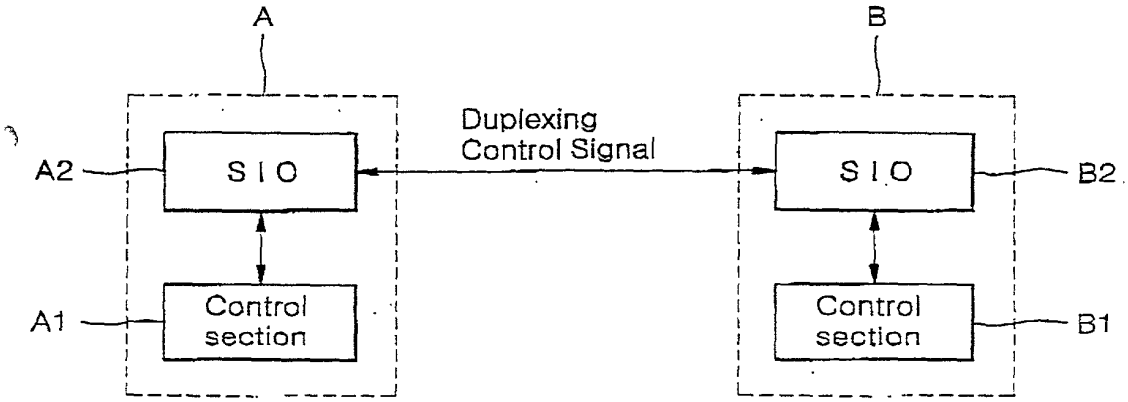

A
B
A2
S I O
Duplexing
Control Signal
S I O
B2
A1
Control
section
Control
section
B1

Fig. 3

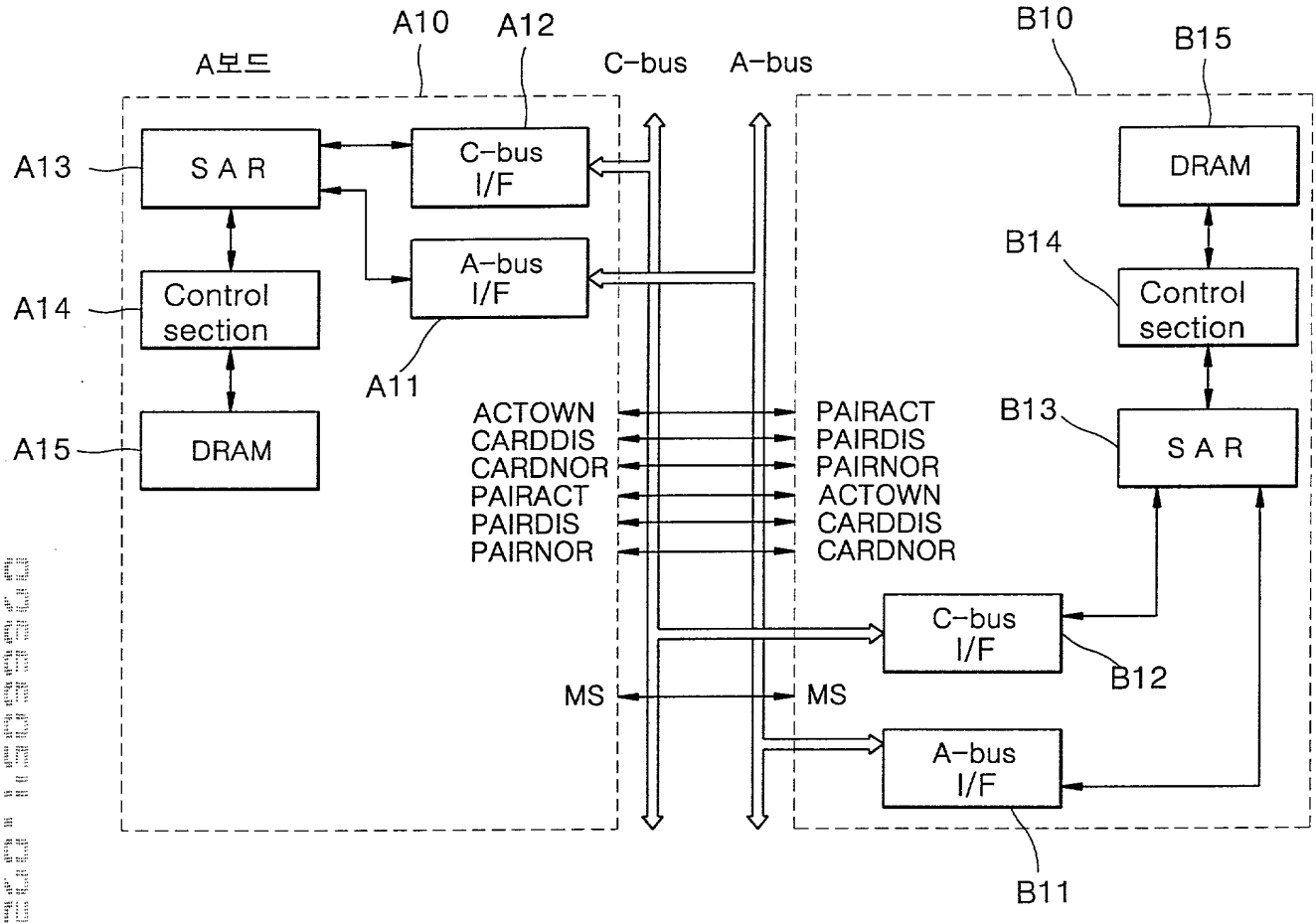
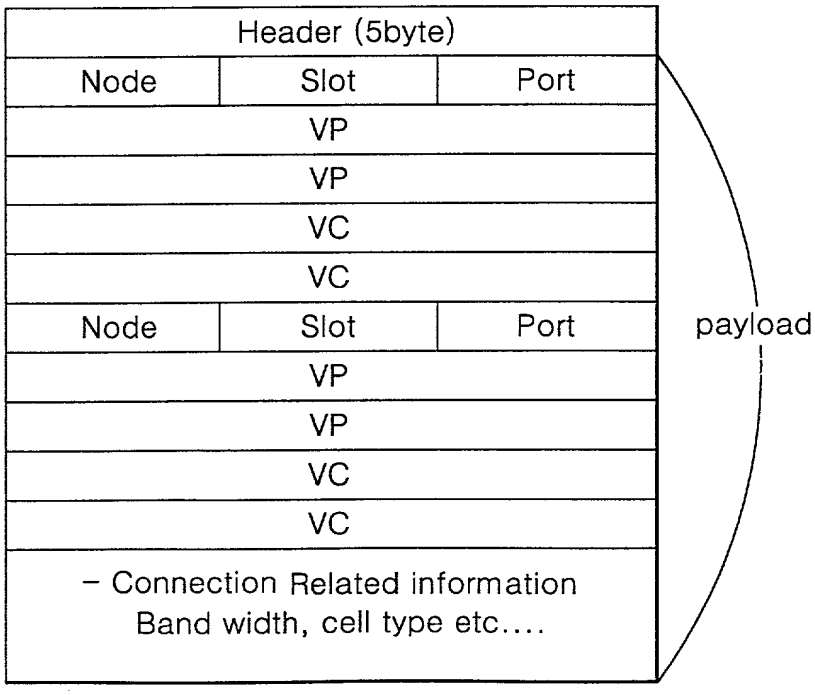

A보드
A10
A12
C-bus
A-bus
B10
B15
A13
S A R
C-bus I/F
DRAM
B14
A-bus I/F
Control section
A14
Control section
A11
A15
DRAM
ACTOWN
CARDDIS
CARDNOR
PAIRACT
PAIRDIS
PAIRNOR
PAIRACT
PAIRDIS
PAIRNOR
ACTOWN
CARDDIS
CARDNOR
B13
S A R
C-bus I/F
B12
MS
MS
A-bus I/F
B11

Fig. 4


Header (5byte)
Node
Slot
Port
VP
VP
VC
VC
Node
Slot
Port
VP
VP
VC
VC
- Connection Related information
Band width, cell type etc....
payload

Docket No.: HI-017

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled SYSTEM AND METHOD FOR CONTROLLING DUPLEXING IN AN ATM SWITCHING SYSTEM,the specification of which

[X] is attached hereto. [ ] was filed on _____ as Application Serial No. _____and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s): Number	**Country**	**Foreign Filing Date Month/Day/Year**
40760/1999	Republic of Korea	September 21, 1999

I hereby claim the benefit under 35 U.S.C.119(e) of any United States provisional application(s) listed below.

Application Number(s):	**Filing Date(Month/Day/Year)**

I hereby claim the benefit under 35, U. S. C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U. S. C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U.S. Application or PCT Parent Number	**Filing Date(Month/Day/Year)**	**Parent Patent Number (if applicable)**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) and/or agent(s):Daniel Y.J. Kim, Registration No. 36,186 and Mark L. Fleshner, Registration No. 34,596; Carl R. Wesolowski, Registration No. 40,372, John C. Eisenhart, Registration No. 38,128, Rene A. Vasquez, Registration No. 38,647; Stuart I. Smith, Registration No. 42,159; Carol L. Druzbick, Registration No. 40,287; Anthony H.Nourse, Registration No. 46,121; and Margaret A. Burke, Registration No. 34,474, all of

FLESHNER & KIM, LLP
P. O. Box 221200
Chantilly, Virginia 20153-1200

with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and all future correspondence should be addressed to them.

****

Full name of sole or first inventor: Sang Ho Lee

Inventor's signature: Lee Sang ho Date: september 19, 2000

Residence: Kyongki-do, Korea

Citizenship: Republic of Korea

Post Office Address: Jugong APT 408-204,650, Hwa seo-dong, Jangan-gu, Suweon-shi, Kyongki-do,Korea

****

Full name of joint inventor(s):

Inventor's signature: Date:

Residence:

Citizenship:

Post Office Address :

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